

## Optocoupler, Phototransistor Output (Dual, Quad Channel)

### Features

- Current Transfer Ratio at  $I_F = 1.6 \text{ mA}$
- Double Molded Package Offers Isolation Test Voltage 5300  $V_{RMS}$ , 1.0 sec.

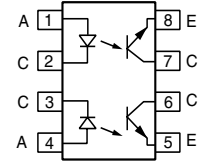
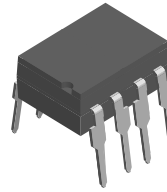
### Agency Approvals

- UL - File No. E52744 System Code H or J
- CSA 93751
- BSI IEC60950 IEC60965
- FIMKO

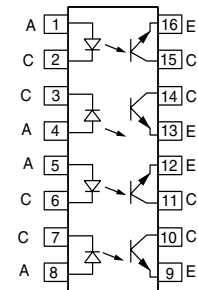
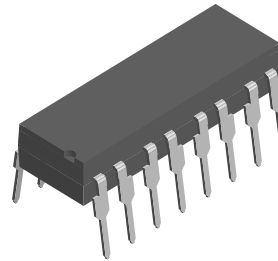
### Description

The ILD3/ ILQ3 are optically coupled isolated pairs employing GaAs infrared LEDs and silicon NPN phototransistors. Signal information, including a DC level, can be transmitted by the drive while maintaining a high degree of electrical isolation between input and output. The ILD3/ ILQ3 are especially designed for driving medium-speed logic and can be used to eliminate troublesome ground loop and noise problems. Also these couplers can be used to replace relays and transformers in many digital interface applications such as CTR modulation. The ILD3 has two isolated channels in a single DIP package and the ILQ3 has four isolated channels per package.

Dual Channel



Quad Channel



1179012

### Order Information

Part	Remarks
ILD3	CTR > 500 %, Dual Channel DIP-8
ILQ3	CTR > 500 %, Quad Channel DIP-16

For additional information on the available options refer to Option Information.

### Absolute Maximum Ratings

$T_{amb} = 25\text{ °C}$ , unless otherwise specified

Stresses in excess of the absolute Maximum Ratings can cause permanent damage to the device. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of this document. Exposure to absolute Maximum Rating for extended periods of the time can adversely affect reliability.

### Input

Parameter	Test condition	Symbol	Value	Unit
Reverse current		$V_R$	6.0	V
Forward continuous current		$I_F$	60	mA
Surge current		$I_{FSM}$	2.5	A
Power dissipation		$P_{diss}$	100	mW
Derate linearly from 25 °C			1.3	mW/°C

### Output

Parameter	Test condition	Symbol	Value	Unit
Collector-emitter breakdown voltage		$BV_{CEO}$	50	V
Collector current		$I_C$	50	mA
	$t < 1.0\text{ ms}$	$I_C$	400	mA
Power dissipation		$P_{diss}$	200	mW
Derate linearly from 25 °C			2.6	mW/°C

### Coupler

Parameter	Test condition	Symbol	Value	Unit
Isolation test voltage (between emitter and detector, refer to standard climate 23°C/50% RH, DIN50014)	$t = 1\text{ sec.}$	$V_{ISO}$	5300	$V_{RMS}$
Creepage			$\geq 7$	mm
Clearance			$\geq 7$	mm
Isolation resistance	$V_{IO} = 500\text{ V}, T_{amb} = 25\text{ °C}$	$R_{IO}$	$10^{12}$	$\Omega$
	$V_{IO} = 500\text{ V}, T_{amb} = 100\text{ °C}$	$R_{IO}$	$10^{11}$	$\Omega$
Power dissipation		$P_{tot}$	250	mW
Derate linearly from 25 °C			3.3	mW/°C
Storage temperature range		$T_{stg}$	- 40 to + 150	°C
Operating temperature range		$T_{amb}$	- 40 to + 100	°C
Junction temperature		$T_j$	100	°C
Soldering temperature	2.0 mm case bottom	$T_{sld}$	260	°C



### Electrical Characteristics

$T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified

Minimum and maximum values are testing requirements. Typical values are characteristics of the device and are the result of engineering evaluation. Typical values are for information only and are not part of the testing requirements.

### Input

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Forward voltage	$I_F = 60\text{ mA}$	$V_F$		1.25	1.65	V
Reverse current	$V_R = 6.0\text{ V}$	$I_R$		0.01	10	$\mu\text{A}$
Capacitance	$V_R = 0\text{ V}$ , $f = 1.0\text{ MHz}$			25		pF
Thermal resistance, junction to lead		$R_{thjl}$		750		K/W

### Output

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Collector-emitter leakage current	$V_{CE} = 15\text{ V}$	$I_{CEO}$		5.0	70	nA
Collector-emitter capacitance	$V_{CE} = 5.0\text{ V}$ , $f = 1.0\text{ MHz}$	$C_{CE}$		6.8		pF
Thermal resistance, junction to lead		$R_{thjl}$		500		K/W

### Coupler

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Capacitance (input-output)	$V_{IO} = 0\text{ V}$ , $f = 1.0\text{ MHz}$	$C_{IO}$		0.8		pF

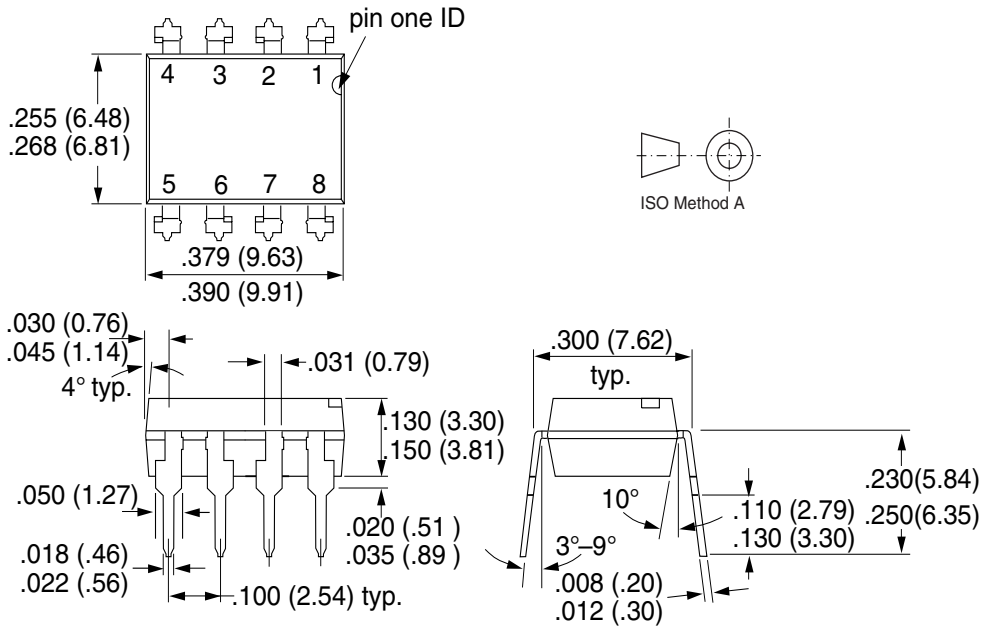
### Current Transfer Ratio

Parameter	Test condition	Part	Symbol	Min	Typ.	Max	Unit
Saturated Current Transfer Ratio (ILD/Q3-1)	$I_F = 1.6\text{ mA}$ , $V_{CE} = 0.4\text{ V}$	ILD3	$CTR_{sat}$	300			%
Saturated Current Transfer Ratio (ILD/Q3-2)	$I_F = 1.0\text{ mA}$ , $V_{CE} = 0.4\text{ V}$	ILD3	$CTR_{sat}$	100			%

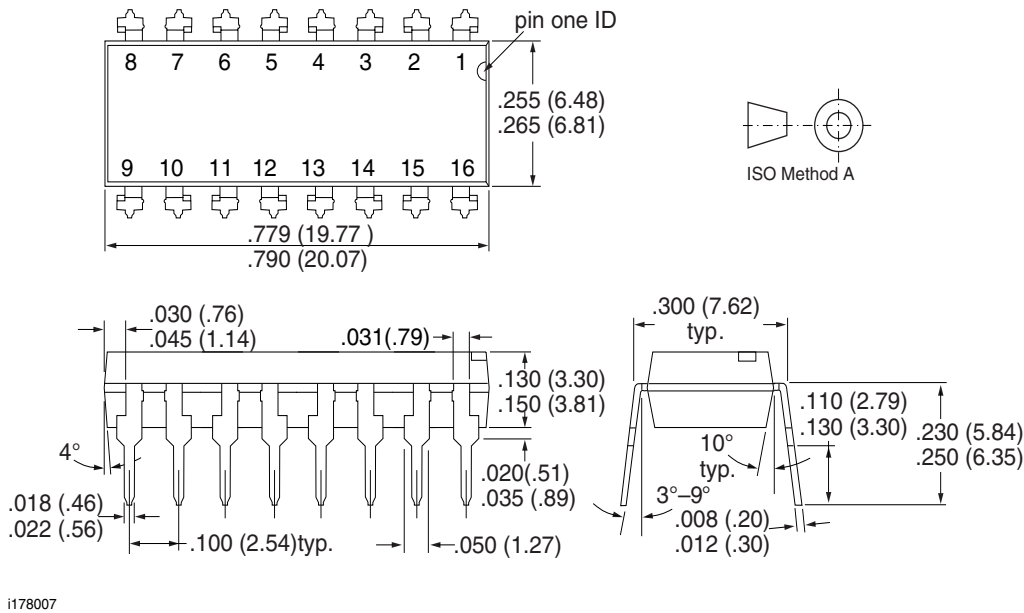
### Common Mode Transient Immunity

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Common mode rejection output high	$V_{CM} = 50\text{ V}_{P-P}$ , $R_L = 10\text{ K}\Omega$ , $I_F = 0\text{ mA}$	$CM_H$		5000		V/ $\mu\text{s}$
Common mode rejection output low	$V_{CM} = 50\text{ V}_{P-P}$ , $R_L = 10\text{ K}\Omega$ , $I_F = 0\text{ mA}$	$CM_L$		5000		V/ $\mu\text{s}$
Common mode coupling capacitance		$C_{CM}$		0.01		pF

### Package Dimensions in Inches (mm)



### Package Dimensions in Inches (mm)



## **Ozone Depleting Substances Policy Statement**

It is the policy of **Vishay Semiconductor GmbH** to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operating systems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

**Vishay Semiconductor GmbH** has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

**Vishay Semiconductor GmbH** can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

**We reserve the right to make changes to improve technical design  
and may do so without further notice.**

Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use Vishay Semiconductors products for any unintended or unauthorized application, the buyer shall indemnify Vishay Semiconductors against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

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